CHRONIC DUODENAL ULCER COMPARATIVE STUDY OF DIFFERENT METHODS OF MANAGEMENT

THESIS

Submitted in Partial Fulfilment
for the Master Degree of General Surgery

By
Alaa El-Din Abdalla Farrag
M. B., B. Ch. (Ain Shams)

Supervised by

Prof. Dr. M. SAMIR ABOU ZEID
Prof. of Surgery

Faculty of Medicine
Ain Shams University

1981

A C K N O W L E D G E M E N T

I wish to express my sincere gratitude to Professor Dr. M. Samir Abou Zeid, Professor of Surgery, for his kind approval to register the subject of this thesis and his continuous advice and close supervision.

I would like also to thank Dr. Nadia Nagi, Resident of Clinical Pathology, for her help in preoperative and postoperative estimation of hydrochloric acid secretion.

C O N T E N T S

I N T R O D U C T I O N

At the turn of the century, peptic ulceration became an increasingly important cause of morbidity. The aim of this work is to review the literature written about chronic duodenal ulcer and to compare the surgical methods of treatment applied to it.

The thesis also includes a note on the anatomy of the stomach and abdominal course of the vagus nerve, physiology of the stomach, aetiology, pathology and methods of investigations of cases of chronic duodenal ulcer. It also includes a note on the medical treatment of chronic duodenal ulcer.

The material comprises ten cases of chronic duodenal ulcer studied clinically, radiologically and endoscopically.

Preoperative and postoperative estimation of hydrochloric acid is carried out. The results of three types of operations namely; truncal vagotomy, superselective vagotomy and anterior Hofmeister Polya operation are discussed.

REVIEW OF LITERATURE

ANATOMY OF STOMACH

The stomach is the most dilated part of the digestive tube. It lies in the epigastrium, left hypochondrium and umbilical regions. Its shape and position vary according to its condition and the condition of the surrounding viscera. The capcity of the stomach varies with age, being about 30 ml at birth, increasing gradually to about 1000 ml at puberty and reaching to about 1500 ml in the adult. (Warwick et al., 1973).

The stomach consists of fundus, body, pyloric antrum and pylorus. The fundus is that part which projects upwards, in contact with the left dome of the diaphragm, above the level of the cardiac orifica. It is usually full of gas. The body extends from the fundus to the level of the incisura angularis, a constant notch in the lower part of the lesser curvature. The pyloric antrum extends from this level, narrowing gradually towards the pylorus. The pylorus is palpably thicker than the rest of the stomach wall and the pyloric canal is held closed by the tonus of the pyloric sphincter except when the latter relaxes to allow the stomach to expel a jet of its contents into the duodenum (Last, 1977).

The stomach has two openings, two curvatures, and two surfaces.

The Gastric Orifices:

The opening by which the oesophagus communicates with the stomach is the cardiac orifice. It is situated on the left of the median plane, behind the 7th costal cartilage, one inch from its junction with the sternum and at the level of the eleventh thoracic vertebra. It is placed about 10 cm from the anterior abdominal wall and is 40 cm from the incisor teeth.

The opening into the duodenum is the pyloric orifice. It lies about 1.2 cm (½ inch) to the right of the median plane near the level of the lower border of the first lumbar vertebra (transpyloric plane). Its position is indicated by the pyloric constriction. In the living, it can be indicated by the prepyloric vein (vein of Mayo) which runs vertically across its anterior surface between the right gastric vein and the right gastro-epiploic vein.

The Gastric Curvatures:

The lesser curvature forms the right border of the stomach. It descends as a continuation of the right margin of the oesophagus in front of the decussating fibres of right crus of the diaphragm, and then, turning

to the right, it curves below the omental tuberosity of the pancreas and ends at the pylorus. The most dependant part of the curve forms a notch, called the incisura angularis, which varies in position with the state of distension of the stomach. The lesser curvature gives attachment to the two layers of lesser omentum containing the right and left gastric vessels.

The greater curvature forms the left border of the stomach. It is 4-5 times as long as the lesser curvature. It begins at the cardiac orifice where a notch is formed, between it and the lower end of the oesophagus, this is the cardiac notch. Then the greater curvature arches upwards, backwards and to the left to define the fundus, the highest point of it is on a level with the left fifth intercostal space just below the left nipple but this level varies with phases of respiration. Then the greater curvature curves downwards and forwards with a convexity downwards and to the left, and finally upwards and to the right till it ends at the pylorus. Directly opposite the angular notch the greater curvature forms a bulge which is the left extremity of the pyloric part of the stomach; this is limited on the right by a slight groove, which indicates the subdivision of the pyloric part into a pyloric antrum and pyloric canal.

The latter is only 2-3 cm in length and terminates at the pyloric constriction. The greater curvature is covered at its begining by the peritoneum continuous with that on the front of the stomach. On the left side of the fundus and adjoining part of the body, the greater curvature gives attachment to the gastrosplenic ligament, while its lower portion gives attachment to the two layers of greater omentum separated from each other by the gastro-epiploic vessels. The gastrosplenic ligament and the greater omentum are directly continuous being parts of the original dorsal mesogastrium.

The Gastric Surfaces:

When the stomach is empty and its walls contracted, its surfaces are almost superior and inferior, but when it is distended they become anterior and posterior respectively. So, they are described as anterosuperior and posteroinferior.

The left part of the anterosuperior surface is posterior to the left costal margin. It is in contact with the diaphragm, which separates it from the left pleura, the base of the left lung, the pericardium, and the 6th, 7th, 8th and 9th ribs and intercostal spaces of the left side. It is related to the costal attachment

of the upper fibres of origin of the transversus abdominis. The upper and left part of this surface lies in contact with the gastric surface of the spleen. The right half is in relation with the left and quadrate lobes of the liver and with the anterior abdominal wall. When the stomach is empty, the transverse colon may lie on the front of this surface. The whole surface is covered with peritoneum and a part of the greater sac intervenes between it and the above structures.

The postero-inferior surface is related to the diaphragm, the left suprarenal gland, the upper part of the front of the left kidney, the splenic artery, the anterior surface of pancreas, the left colic flexure and the upper layer of the transverse mesocolon. These structures form the stomach bed, but the stomach is separated from them and can slide over them due to the intervening omental bursa. The gastric surface of the spleen is also described as part of the stomach bed, but it is separated from the stomach by a part of the greater sac. The greater omentum and the transverse mesocolon separate the stomach from the duodeno-jejunal flexure and small intestine. The postero-inferior surface is covered with peritoneum, except near the cardiac orifice, where there is a small triangular area, in direct contact

with the left crus of diaphragm, sometimes with the left suprarenal gland. The left gastric vessels reach the lesser curvature of the stomach at the right extremity of this area, and from its left side a short peritoneal fold, termed the gastrophrenic ligament passes to the inferior surface of the diaphragm.

Structure of the Stomach:

The peritoneum gives the stomach a complete serous coat, except along the curvatures and also over a small area which is in direct contact with the diaphragm, to the left of the cardiac orifice.

The muscular coat consists of three layers of involuntary muscle; an outer longitudinal, an intermediate circular, and an inner oblique stratum. The circular layer is greatly thickened at the pylorus to form the sphincter.

The mucous cost is thick and vascular. It is thrown into numerous folds which, in general, are longitudinal in direction and best marked along the greater curvature. These folds disappear when the stomach is distended. The mucous membrane along the lesser curvature is smooth, even when the stomach is empty.

Two longitudinal folds, one on the anterior surface and the other on the posterior surface, lie near and in the line of lesser curvature, and it may be that the oblique fibres of the muscular coat participate in the formation of these folds. The edges of these folds come together when the stomach is empty and they therefore form a canal which leads from the cardiac orifice to the pyloric antrum. This canal has been termed the 'gastric street' or 'Magenstrasse', and fluids - and perhaps food - may be conveyed to the pyloric end of the stomach along it. The pyloric antrum and the Magenstrasse are the common sites for peptic ulceration in the stomach, and this is probably due, in large measure, to the fact that in these situations the mucous membrane produces little or no hydrochloric acid. It has also been suggested that the muscular fibres of the Magenstrasse form an interlacing network, and that the vessels which traverse the interstices may be occluded when the muscle is in spasm. It has also been stated that vagal stimulation may cause marked constriction of the mucosal vessels. In either instance if the occlusion is prolonged, areas of the mucous membrane may be rendered anaemic, or may even become necrosed and be subsequently digested, so that an ulcer is formed.

The gastric mucous membrane has three types of glands. The principal glands are found throughout the fundus and the body, and produce pepsin and hydrochloric acid. The pyloric glands occupy the antrum, and extend for variable - and sometimes considerable - distance above the pylorus along the lesser curve. They secrete a mucinous fluid of markedly alkaline reaction, and also the anti-anaemic factor of the gastric juice. The glands in the body of the stomach contain relatively by far the greatest number of acid secreting (oxyntic or parietal) cells and if these are considered as representing 100 per cent then relatively the glands along the lesser curvature contain only 75 per cent, and in many cases considerably less, the fundus glands about 50 per cent and the glands of the pyloric region 1 per cent or even none. The cardiac glands occur in a small area at the cardia, and, like the pyloric glands, secrete an alkaline mucus.

Blood Supply of Stomach and Duodenum:

The stomach has an abundant arterial supply derived from the right and left gastric and gastro-epiploic arteries forming arcades along the lesser and greater curves respectively, and from the short gastric arteries